CAA Compliance Inspection Report

Partial Compliance Evaluation
Sumitomo Metal Mining Pogo LLC

near
Delta Junction, Alaska

Inspection Dates: September 29-30, 2013

Zachary J. Hedgpeth 1-13-14

Report Author Signature Date

Zach Hedgpeth, PE
CAA Inspector
EPA Region 10

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Attachments

1. Basic Facility and Inspection Information

Facility:	Sumitomo Metal Mining Pogo LLC Near Delta Junction, AK
Mailing Address:	P.O. Box 145, Delta Junction, AK 99737
AFS Number:	0229000069
FRS Number:	110009058802
SIC:	1041 – Gold Ores
NAICS:	212221 – Gold Ore Mining
Permit Number:	Title V Air Operating Permit No. AQ0406TVP01P State Minor Permit No. AQ0406MSS06 Alaska Department of Environmental Conservation
Facility Contact:	Sally McLeod, Environmental Manager, 907-895-2879
Agency Inspectors:	Zach Hedgpeth, EPA Region 10
Dates of Inspection:	September 29-30, 2013
Date of Report:	January 13, 2014

2. Introduction

The Pogo Mine, owned by Sumitomo Metal Mining Pogo LLC, is located in remote central Alaska about 120 road miles southeast of Fairbanks. Maps showing the location of the facility are included as Attachment 2. The facility is a gold mine. Process emissions from the facility are released from the various emission units described in the facility air permits, as well as a solid waste incinerator which is subject to 40 CFR 60, subpart CCCC – Standards of Performance for Commercial and Industrial Solid Waste Incineration (CISWI) Units, which is included as Attachment 3.

Pogo Mine is a minor source of air pollutants. The facility has an existing minor permit (Attachment 4) issued by the Alaska Department of Environmental Conservation (ADEC) which permitted construction of the various emission units at the mine, while allowing the facility to avoid triggering Title V major source emission thresholds. Pogo Mine also has a Title V permit issued by ADEC for certain units which are subject to the area source gold mining Maximum Achievable Control Technology (MACT) standards in 40 CFR 63, subpart EEEEEEE (7E). The facility Title V permit and Statement of Basis are included as Attachments 5 and 6.

The purpose of this partial compliance evaluation (PCE) Clean Air Act (CAA) inspection was to observe the initial compliance testing of the incinerator under the NSPS rule. Additionally, the emissions and operational data gathered during the testing will serve as the primary basis for establishment of custom operating limits under the provisions of 40 CFR 60.2115. Establishment of custom operating limits is necessary under the NSPS rule because the incinerator is not equipped with add-on air pollution controls, relying solely on good combustion conditions for emissions reductions.

As requested by the Region 10 Tribal and Air Toxics Unit, I observed source testing of the CISWI unit at the facility for purposes of complying with the initial performance testing requirements of NSPS subpart CCCC. The CISWI unit at Pogo qualifies as a small, remote incinerator under the rule, and is therefore subject to the emission limits specified in Table 8 in subpart CCCC. Table 8 also specifies the EPA reference test methods and averaging times which are to be used in determining compliance with the applicable emission limits.

As negotiated in advance with EPA Region 10, the emission testing was conducted over a range of operating scenarios, as described in pre-test correspondence between facility personnel and EPA staff (Attachment 7). Testing began on Sunday, September 29 and concluded on Thursday, October 2, 2013. I was onsite Sunday and Monday morning, but had to leave the testing project earlier than planned due to the government shutdown. Photos of the facility and testing work I observed are included as Attachment 1.

3. Emission Unit Description

The CISWI unit at the Pogo Mine is a model PC0400-V05-RC6 incinerator and was manufactured by ACS, Inc. of Bellingham, Washington. The incinerator is referred to as "Unit 412" in certain facility and consultant documents based on its designation in the facility minor permit issued by ADEC. The incinerator was installed in a custom fabricated building at Pogo Mine, with construction of the incinerator commencing after May 11, 2011 according to the facility[1]. According to the manufacturer, the incinerator can burn up to 600 pounds of waste per hour[2] (although it is expected to be limited to approximately 10% of this capacity based on the emission testing), and is equipped with both primary and secondary combustion chambers. The only supplemental fuel fired in the incinerator at Pogo Mine is propane, although the unit could be configured to burn oil. The primary combustion chamber contains a single burner rated at 800,000 British thermal units per hour (Btu/hr), while the secondary combustion chamber is equipped with two additional propane burners, each rated at 800,000 Btu/hr. The incinerator is not equipped with add-on air pollution control equipment, and exhaust gases are released through a vertical stack.

According to materials submitted to EPA by Pogo Mine, the incinerator burns solid waste produced at the facility which falls into three basic categories:

1. Wastes similar to municipal solid waste, originating from general facility refuse collection and the facility cafeterias,
2. Sludge from the facility general wastewater treatment plant (as opposed to the facility industrial process water treatment plant), and
3. Non-hazardous oily absorbent materials, referred to as oily "rags".

My observations of the waste combusted in the incinerator during emission testing on September 29 and 30 were consistent with this description.

4. Arrival at Pogo Mine – Saturday, September 28, 2013

I arrived at the mine site early in the afternoon courtesy of Stacey Staley of the Pogo Mine Environmental Department, who had picked me up at my hotel in Fairbanks that morning. Although no formal opening conference was held, I presented my EPA inspector credentials to Ms. Staley and Pogo Mine security personnel upon entry onto Pogo Mine property near the entrance to the facility access road.

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[1] See page 1, 1st paragraph of *Pogo Mine Initial CISWI Performance Test Incinerator Parameters / Operating Limits Petition*, submitted under cover dated May 14, 2013.

[2] The maximum charge weight for the incinerator is listed as 150 pounds (see page 12 of the manufacturer's incinerator operating manual, Attachment 8), while the default charge interval is listed as 15 minutes (see page 8 of Attachment 8), resulting in a maximum hourly charge rate of 600 pounds of waste per hour. The actual waste charge weight limit is expected to be 53 pounds per hour (rolling 1-hour average) based on the waste charge rates that occurred during the testing (*Sumitomo Metal Mining Pogo LLC Unit 412 Site Specific Operating Limits Report, November 2013*).

5. Test Observation Activities – Sunday, September 29, 2013 – 08:00 to 20:30

On the morning of Sunday, September 29, 2013, I arrived at the Pogo Mine incinerator in the company of Mike Short of Specialized Environmental Solutions, consultant to Pogo Mine, and Ben Farnham, an environmental engineer with the Pogo Mine Environmental Department.

Upon arrival at the incinerator building, I was introduced to Larry, the incinerator operator. The test crew from AECOM was already at the incinerator setting up equipment, including the Project Manager, John Rosberg. Accompanying Mr. Rosberg were Aaron (last name not noted) and Doug Bopray.

My observations and notes are summarized below:

Pre-Sampling Notes

Prior to the start of the first test run, Mike Short showed me an Excel spreadsheet he had put together to track the mix of wastes charged to the incinerator on a charge-by-charge basis. As each load of waste is charged to the incinerator, the spreadsheet can be used to calculate the running weight percentage of each of the three waste streams. Photo 66 in the photolog (Attachment 1) shows this spreadsheet. As indicated in Attachment 7, the waste mix targets for Day 1 of testing were as follows:

- MSW: 35%
- Sludge: 45%
- Oily "Rags": 20%

At approximately 08:40 a job safety meeting was held in the parking area adjacent to the incinerator building. All AECOM and Pogo Mine staff listed above as onsite today attended the meeting, as did I. The meeting was led by Mr. Farnham, and stressed the importance of safety first as the testing work proceeded. Certain specific hazards related to the testing work were discussed, such as the extremely hot exhaust gas (and therefore very hot stack), and issues related to using the man-lift to access the sampling ports.

Following the safety meeting, I proceeded to observe and document the incinerator facilities as well as the unit itself in more detail. I specifically examined the following, as depicted in the attached photolog:

- General setting of the incinerator, including the building and propane tank.
- Waste types, storage area, and segregation methods.
- Waste loading hopper, scale, and ram chamber.
- Primary and secondary combustion chambers and their burners and blowers.
- Incinerator control display screen, parametric settings and measured values.

At 09:22 I noted that the clock display on the incinerator was approximately 20 minutes slow. After discussing with AECOM personnel, it was decided to use the incinerator clock as the reference point for testing times, but to note the time discrepancy. The actual time

differential appeared to be 17 minutes; i.e. at 09:24, the incinerator clock was displaying 09:07.

Discussions with Larry and John Rosberg confirmed that the incinerator had no waste charged prior to testing, and was being fired solely using propane to achieve design temperatures in the primary and secondary combustion chambers prior to the first waste charge. It was also noted that waste charging would continue uninterrupted in between test runs, and that test runs would start and stop based on activation of the charge ram. In other words, any given test run would capture a certain number of complete waste charge cycles.

Run "I5-1" Notes

The run began at 11:06 according to the incinerator clock. John Rosberg explained that this would be a Method 5 run, with planned duration of approximately 72 minutes. The nomenclature used by AECOM for this project designated this as "Run I5-1". The run began just before the first waste charge of the day.

I observed the incinerator exhaust stack immediately prior to and during the initial waste charge from the adjacent gravel parking area. At approximately 11:15[3] by the incinerator clock, I noted significant opacity in the form of blue smoke as the initial load of waste was charged to the incinerator. I did not conduct a formal Method 9 opacity observation at this time. Smoke was noticeable for less than 5 minutes, after which the opacity was approximately zero. See photos 56-59 in Attachment 1.

Run "I5-1" was completed at 12:42. Following the run, the one-piece quartz glass probe liner broke as the sampling train was being brought down from the stack for recovery. AECOM staff reported that nothing touched the probe to cause the break, and after some discussion it was hypothesized that thermal contraction likely caused the break. The ambient air temperature was near 40° F, while the in-stack exhaust gas temperature was about 1,150° F. Since the break occurred at the point where the quartz probe liner exited the metal sampling probe, the theory of differential cooling and resulting contraction issues seemed the most plausible explanation. Based on this occurrence, it was decided to try placing a "hot glove" (visible in photo 86) over the quartz nozzle where it extends beyond the metal sampling probe when the probe is removed from the stack after the next run in an effort to allow the exposed section of the glass nozzle/sample probe to cool more slowly.

Run "I29-1" Notes

The run began at 14:06 and was only 60 minutes in duration, ending at 15:06. The planned duration was approximately 120 minutes, however, a second glass nozzle break was experienced (again, apparently due to thermal contraction issues) when the nozzle was removed from the sampling port in order to change ports for the second traverse, or halfway through the sampling run. During the previous Method 5 run, the port change had been

[3] This time is an estimate of the incinerator clock time. Photo #56 showing the smoke is time stamped at 12:32 Pacific Daylight Time. Local Alaska time is one hour earlier, and the incinerator clock is approximately 17 minutes slow, resulting in the 11:15 estimated time.

achieved without the glass nozzle breaking, so it had been assumed the port change would be possible for the Method 29 run; unfortunately, this was not the case.

At this point, a lengthy discussion ensued regarding potential mitigative actions to avoid breaking any more glass sampling probe liners/nozzles, since only a limited number of these custom items were available onsite. Potential actions to mitigate the temperature issues which were discussed included the following:

1. Placing a hot glove over the glass nozzle, as described above.
2. Using a heat gun to keep the glass nozzle warm after it is removed from the stack.
3. Modification of the metal probe sleeve to remove the fitting that may be contacting the glass so that the glass liner would only contact the internal insulation inside the metal probe sleeve and there would theoretically be no glass-metal contact.
4. Add an external heater using an extension rod parallel to the sampling train to blow warm air on the glass nozzle as it is removed from the stack.

During these discussions, AECOM personnel proposed conducting future runs using only a single sampling port with a double traverse. This approach would eliminate switching ports midway through each run, which requires taking the sampling probe out of the stack. I agreed this would be a reasonable measure to take in order to increase the likelihood that the testing effort would be able to be completed with the equipment available. I also considered the fact that should testing not be completed during this effort, a follow-up mobilization to conduct additional testing would not be possible until summer 2014 due to Alaskan weather conditions through the winter.

Although sampling from a single port (versus the standard two ports at 90° angles) does not provide sample collection along two intersecting cross sections of the exhaust gas, in my judgment it was a reasonable approach in this specific situation. The incinerator exhaust stack is a straight run vertically from the secondary combustion chamber, which reduces the likelihood for stratified emissions or velocity profiles across the stack. Review of the stack velocity measurements made from each sampling port (during run "I5-1") indicates good velocity consistency throughout the stack. Port changes did not occur for the remaining test runs, to my knowledge.

Also during this break between runs, Mike Short proposed increasing the percentage of oily absorbent materials ("rags") to about 30% during one of the later operational scenarios tested. In Pogo's proposed operational scenarios (see Attachment 7), all scenarios which were to include oily absorbs had proposed 20%. I had no objection to this change.

Run "I23-1" Notes

The run began at 17:22 and ended at 19:29, for a duration of 127 minutes. Two sampling traverses were made using the same sampling port, as discussed above. At the end of the run, AECOM personnel placed a hot glove over the quartz nozzle and attached an electric heater to a steel rod mounted parallel to the sample probe such that warm air was directed into the opening of the hot glove. This arrangement is shown in photos 85 and 86. The test run and sample recovery were successfully completed without breakage of the quartz nozzle. I departed the incinerator at approximately 20:30.

6. Test Observation Activities – Monday, September 30, 2013 – 09:00 to 12:00

I arrived at the Pogo Mine incinerator in the company of Mike Short and Ben Farnham. The start of testing had been delayed due to a failed thermocouple on the incinerator secondary combustion chamber. Repairs had been completed by the time I arrived at the incinerator, and testing personnel were waiting for the incinerator combustion chambers to reach design temperature before beginning testing for the day.

My observations and notes are summarized below:

Run "I23-2" Notes
The run began at 09:23 and ended at 11:30, for a duration of 127 minutes. Single port sampling was again performed, along with the mitigative measures described above to address the heat stress breakage issues. The efforts were again successful, and the quartz nozzle was successfully removed from the stack and recovered without breakage.

The run again coincided with the first waste charge of the day. I again observed the incinerator exhaust stack immediately prior to and during the initial waste charge. This time little to no opacity was observed throughout the first waste charge. I then returned to the incinerator building to examine the waste charging records in order to determine whether there was any difference in the content of the initial waste charge between 9/29/13 and 9/30/13. The records indicated that the initial waste charge on September 29th consisted of 37 pounds of Type II MSW (general garbage) while the initial waste charge on September 30th consisted of 34 pounds of Type III MSW (food waste) and 10 pounds of oily "rags". Although the inclusion of oily "rags" in the initial waste charge on 9/30/13 may have contributed to lower initial opacity, a clear trend with respect to waste type charged, combustion chamber temperatures, and initial opacity was not identified over the limited dataset. Observation of the remaining two days testing may have been contributed towards an understanding of the potential causes of startup opacity, but this was not possible due to my early departure.

I departed the facility at approximately 12:00.